



#### IV.—*A Quarry and Workshop of the Stone Age in New Brunswick.*

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(Read May 29, 1900.)

Some twenty years ago the author in collecting stone implements on the shores of the Kennebecasis river in Kings county, New Brunswick, had met with occasional well finished implements of carnelian, chalcedony and agate.

On comparing the material of which these were made with specimens of these minerals which were in the Gesner museum of the Natural History Society of New Brunswick, no difference of a material kind was observed.

These minerals of the Gesner collection were from Washademoak lake in Queen's county, which occupies a valley some distance to the north of Kennebecasis valley. At the time when the carnelian objects were collected in Kennebecasis valley it seemed probable that they had been fabricated on the Kennebecasis river from pieces of stones swept southward to that river from Washademoak valley by glacial ice (as the southward transportation of such material as the surface stones of a country during the glacial period is a well established fact). Rough pieces of agate apparently from such a source were found along the shores of the Kennebecasis river.

More extended observations on the St. John river made at a later period, on the occasion of a summer camp of observation held by the Natural History Society of New Brunswick at French lake in Sunbury county, suggests another interpretation of the occurrence of these stone implements of the ornamental varieties of quartz on Kennebecasis river, namely that they have been carried there by men of the stone age, and not made on the spot, nor transported by ice.

For instance, at Indian Point on Grand lake,<sup>1</sup> which is to the north of Washademoak valley, chalcedonic material similar to that found in this valley has been found mingled with felsitic and other stones used for the manufacture of stone weapons.

Following up the chain of lakes of which Grand lake is the last, but most important, similar varieties of carnelian and chalcedony were found on the shores of Maquapit lake, the next of the chain, and also around French lake the third of the series, which itself is a double lake.

<sup>1</sup> See accompanying map of the Lake region of St. John R. valley, p. 63.

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No chalcedonic veins similar to those of Washademoak lake are known to the north of these lakes, for beyond them stretches a wide expanse of coal measures, which are devoid of veins of this mineral.

These various finds appear to point to the fact that this material, which readily lends itself to the manipulation of the aboriginal artificer in stone, was really an article of barter; or at least of sufficient importance to be sought for, and carried considerable distances by the men of the stone age.

Interest in these beautiful and finely finished weapons induced the writer to seek the locality from which the material came, of which they were fabricated and to study its distribution.

Dr. Abraham Gesner appears to have discovered the place where this mineral occurs. At page 60 of his third report on the Geology of New Brunswick, he gives the following description of the locality and the rock :—

"On the south-east side of a small cove (Belyea's Cove), the shore is strewn to the distance of half a mile with loose masses of hornstone, jasper, Egyptian jasper, chalcedony and quartz. The jasper is chiefly of a red colour and passes into a milky chalcedony, being arranged in spots and clouds, and shaded with smoky imitative figures. Associated with the jasper is that variety called *Egyptian jasper*, which is distinguished from the other by peculiar zones, circles and clouds of different colours. With these a few small pieces of carnelian were found; but in general, this mineral is too much fractured to afford good specimens. These minerals evidently belong to some trap dyke in the neighbourhood. The sandstones here form cliffs on the shore, or appear beneath its broken fragments."

Prof. L. W. Bailey who has visited the locality from which Dr. Gesner procured his specimens, stated to me that the veins occur in a limestone of Lower Carboniferous age at or near the place mentioned by Dr. Gesner.

The writer did not see this place though he found another locality near McDonald's point,<sup>1</sup> where the same mineral occurs in Lower Carboniferous strata, but in somewhat different relations. Here, on searching along the south shore of Washademoak lake, chalcedony was found in thin irregular seams in a low bank of Lower Carboniferous shale on the west side of Belyea's Cove, which is the first important cove on the south side of the lake above its entrance. The locality was detected by numerous fragments of the rock found on the stony beach in front of the shale bank. This part of the shore was strewn with

<sup>1</sup> See the accompanying map.

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numerous fragments of chalcedony, carnelian, agate and jasper. The pieces on the shore were of finer quality than the rock showing in the shale bank which was largely composed of gray and dark chalcedony,



and so not showing the bright colour or lucidity of the better quality of stone used in the making of weapons. But pieces of this quality were abundant along the shore. The bank consisted chiefly of purplish red shales, but beneath the chalcedonic bands the rock is a soft green shale,

showing in a thin band. These shales are exposed by the erosion of the overlying gray sandstone of the mill stone Grit series.

Though the fragments of ornamental varieties of quartz are so plentiful along this shore, I was disappointed in finding no stone implements here, nor small flakes such as one is accustomed to see near the quarrying ground of an aboriginal people. This is perhaps to be explained by the roughness of the shore, as we may suppose that the stone was taken away to be worked at leisure in more sheltered places.

Nearby this locality for the chalcedony, and nearer the outlet of Washademoak lake is McDonald's Point, which for an aboriginal people had greater attractions than the rocky shore of Belyea's Cove. Here there is a flat sandy piece of land which would afford a good camping ground, with good natural drainage. The point itself projects far enough to form a shelter on its lee side from the surf produced by a north-east wind, blowing down the lake. The lee side of the point also has the advantage of a beach of soft sand on which bark canoes or other fragile craft could be drawn up without damage. Whether this was or was not the reason why the men of the stone age frequented more the lee than the weather side of such points as McDonald's, there can be no question that they did so, for in gathering stone flakes from the beaches around these points, both on the Washademoak, the Kennebecasis and the main St. John river, we have invariably found the flakes most numerous along the lee side of the point, and on those portions of the beach that are freest of stone.

A special advantage which McDonald's Point had over others further up the lake, was, that it was near the narrow channels in the marshes, which divide Washademoak lake from the St. John river. These narrow channels where the fish pass in and out of the lake, would be especially favourable to the capture of fish. In the spring especially these passages swarm with fish passing up to spawn in the lake, and it is not surprising that the locality should attract a nomadic and fishing population. The extensive use made of the ornamental varieties of quartz at McDonald's Point, is seen by the proportion of fragments of them in the debris left here by the arrow-makers.

At this place the proportion of mineral material in the stone weapons, and flakes collected was:—agate 30, carnelian 31, chalcedony (white) 23, gray chalcedony 18, fawn coloured jasper 5, red jasper 4, felsite 2, quartz 1. No other locality for stone weapons found in New Brunswick shows so great a preponderance of chalcedonic material. Some of the less worn fragments show the waxy lustre of freshly broken chalcedony, showing that the site was occupied up to a late period;

but the greater number have a polished surface, due to attrition with sand and pebbles on the shore.

To contrast with this, and as showing that the traffic in carnelian rock was not through the upper part of the Washademoak valley, one may compare the proportion of fragments found at two aboriginal landing places in the upper, narrower part of the valley where the lake narrows into a river.

At Armstrong's wharf, Thorntown, a short distance above the narrows of the Washademoak, the waste chips of stone picked up on the beach were in the following proportions:—felsite 10, quartz 7, chalcedony 1, carnelian 1. Some of the felsite fragments are deeply weathered as though they had been exposed for a long time. Some of the agates are chalcedony at one end and carnelian at the other, precisely like a variety very common at McDonald's Point. The source of the felsites may be in the metamorphic hills on the south of the valley, but such rocks are found on the southern branches of the Canaan river which drains into this valley, and are plentiful at various localities.

A short distance further up the Washademoak valley is Starkey's wharf. On the beach here the following chipped fragments were picked up:—felsite 5, quartz 5, agate 4, chalcedony 1, carnelian 1. Three pieces off a block of purple felsite are perfectly fresh, but an ovate spearhead of felsite found on this beach has been deeply weathered on the exposed side since the misadventure by which it was lost, and in consequence the flow-lines of the felsite rock are quite distinct on its surface. The carnelian, chalcedony and some of the agates could be duplicated at McDonald's Point and Belyea's Cove.

That McDonald's Point at the outlet of Washademoak lake, was the principal working place, is evident from the great abundance of the stone chips in the gravel of its beach. Although I culled the shore on my first visit, on returning to the place a year later with Dr. W. D. Matthew, we found a crop of chips half as heavy as the first one; these had been thrown out from the gravel by the storms of the intervening period.

Though these fragments are now found most abundantly in the beach gravel, it does not follow that the ancient fletchers did their work on the open beach, it seems more likely that the lake has encroached here on the yielding shore and that the sites of the perishable huts or wigwams of this people have been swept away and their reliquæ mingled with the gravelly and sandy foundation on which they rested. At Bocabec in Charlotte county the author found in exploring an aboriginal hut bottom there, that the occupant of the hut was accustomed to work

his arrow-point stock within the hut, and probably at times by the light of the fire within it:<sup>1</sup> so we may suppose that the huts, if not on the site which is now beach, were at least close by it.

With the view of testing the former occupancy of the Kennebecasis river by men of the stone age, and noting the presence or absence of carnelian among the stone chips which they have left, the estuary of this river was examined where it flows through marshes, and where the narrow channels giving passage to the waters of the river, abound in fish. This part of the river would be specially attractive to a people who obtained their living by hunting and fishing.

On the shore of Darling's Island (Matthew's shore, E. end), a sandy point yielded—felsite flakes and arrow-points 7, quartz 4. Some of the felsite fragments were greatly weathered; no carnelian was seen. Crossing to the north side of the valley of the Kennebecasis I examined several gravelly points on the river channel under the Norton shore; at the first point the fragments were chiefly of felsite of purplish gray, gray and buff colours, there were some of gray quartz, and one of carnelian. At the next point was a good chalcedony skin scraper, there was a core of gray quartzite, but the loose flakes found were of felsite and white quartz. At the next point was a core of white quartz, and some flakes of gray quartzite and gray felsite. On the south side of the valley at Saunder's cove a well finished skinning knife of carnelian was picked up and a fragment of carnelian. Thus it would appear that while flakes of carnelian are few, the implements are as numerous as the flakes, as though the manufacture of the implements was chiefly carried on at some other place.

#### AGE OF THE QUARRY.

It might be thought that the business of barter in stone, or of transportation of this material for the manufacture of weapons was confined to the tribes inhabiting the river St. John at the time of its discovery by Europeans. There are indications, however, that this was not the case, but that the chalcedony was used at a much earlier period.<sup>2</sup> This is

<sup>1</sup> See Nat. Hist. Soc. of New Brunswick, Bull. No. x, p. 17.

<sup>2</sup> The deep weathering of the surface to which many of the stone weapons picked up in the valley of the St. John have been subjected, is proof of a long continued occupation of the region by aboriginal tribes. This is sometimes found on both surfaces of a flat implement, but more frequently the corrosion of the surface is mostly confined to one side; tools of felspathic material, such as felspathic slate and felsite, are those which show this weathering most distinctly, although celts of mica schist and argillaceous slates show similar weathering. A spearhead of felsite from this region (Indian Point) had been broken, the parts slightly displaced and then reemented by a calcareous cement, showing the lapse of a considerable interval from the time it was lost, until now lately found.

indicated by the changes in the relations of water and land that have taken place since the men of the stone age scattered their stone chips along the river St. John.

As bearing upon this question one might revert to the discovery of peat bogs along the shores of the Bay of Fundy, which show a subsidence of land along its coast in the recent (geological) period. Such bogs are found on the sides of the harbour of St. John, at L'Etang (or Frye's) Island, and elsewhere in Charlotte county in coves sheltered from the heavy surf of the bay. These bogs go down to low-water mark and further, and could only have been produced when the present belt of intertidal shore was above the sea. The tides in this part of the bay rise to the height of 25 feet or more.

If the present southern coast of New Brunswick were raised eight feet higher than now, the rush of sea-water into the river St. John with the rising tide, would entirely cease and the river waters would have opportunity to drain down to the level of the rocky barrier at the falls. As a result the level of the river would drop about two feet (which is now the rise and fall of tide within the rocky barrier at the falls).

While not effecting to any great extent the steep shores of the lake like expansions near the mouth of the river, such a recession of its waters would greatly influence the areas of shallow water in Queen's and Sunbury counties, and a shrinkage of the large lakes along the eastern side of the river valley would result, the adjoining intervals (flood plain) gaining at the expense of the lakes.

The back of this interval from near Fredericton to the mouth of the Jemseg, or outlet of Grand lake, is drained by a waterway (Porto Bello Creek, etc.), which carries also the drainage of the eastern side of the St. John river valley, including a chain of lakes on that side of the valley, of which the one above named is the most important. This waterway extends from near Fredericton to Gagetown, and so nearly half way to St. John; it abounds with fish and so would offer great attractions to a barbarous people that subsisted by fishing. It is along the shores of this creek and the "thoroughfares" of the lakes into which it flows that we find indications at frequent intervals of men of the stone age. These consist of the remains of pottery of a rude kind, and of flaked fragments, and implements and weapons of stone.

These remains are found, not only on the banks of the waterways or thoroughfares connecting the lakes, but out in the lakes themselves. The remains are found both on the banks of the lakes and on the belt of shallows that stretch along their western shores. Here, mingled with the fine hard sand of the bottom, one finds, not infrequently, small

flakes of felsite and other stones used in the manufacture of arrow-heads, etc., indicating the possibility that the old shore of these lakes is now under water, owing to the submergence of the intervals, due to the rise of the river water in consequence of the inflowing tide.

A curious confirmation of this conjecture is "Ring Creek," on the western shore of Maquapit lake. This is a creek of considerable depth in the form of a half-circle, which has its two openings on the lake, now silted up to a shallow strand at each outlet. A little to the north on this lake shore is the similar shallow opening of the thoroughfare, or creek, from French lake, and a little to south of Ring creek a like entrance to the thoroughfare that leads to Grand lake. The only *raison d'être* for Ring creek is that it is a part of a continuous passage or "thoroughfare" that once connected French lake with Grand lake over a zone of interval or alluvial deposit now submerged beneath Maquapit lake. There is a camping site on the island enclosed by this creek.

On the shores of French lake, as at Apple island in that lake, we found fragments and stone implements, scattered in the gravel of the beach which indicated a camping site on the lake shore; but no outlines of hut bottoms or other structures remain on the banks above the beach. The destruction of the remains of such occupation by man, may however have been due to the violent surf which would roll on these shores when the spring floods of the St. John river annually converts this region into a vast, but shallow lake. Whatever the cause, no traces of habitations now exist.

Coming to Washademoak lake, the centre of the dispersion of the carnelian, there appear to be similar indications that the occupation of these shores by men of the stone age antedates the present configuration of the lake and river borders.

We have remarked upon the fact that stone chips in numbers are scattered through the gravel of the beach at McDonald's Point; this is the case as far down as the beach is uncovered at low water in summer time. As on revisiting this locality after a year's interval a fresh crop of chips was found to have been worked out from the gravel to the surface of the beach by the storms that sweep down the lake in the spring and autumn, it would appear that the present position of the beach is the site where the work of fashioning stone implements and weapons was carried on, and that this site in ancient times was above the reach of the waters of the lake at summer level.

An encroachment of the waters of the lake to the depth of two feet would soon by the beating of the waves upon the beach, remove all traces of habitations that may have existed before the submergence. So it

seems probable that the tribe of "Indians" (aborigines), which now inhabit this part of the country are not alone responsible for the remains of the stone age that are scattered along the shores of these lakes, and along the thoroughfares, or creeks, that connect them, but that their dispersion goes back to a period of greater antiquity.

In sheltered places along this waterway where remains of old camping sites are found, the pottery fragments seem to tell a similar tale. Thus Professor L. W. Bailey has informed me that he found the best remains of aboriginal pottery at Indian Point on Grand lake, by wading and dredging in the shallows along the shore of the thoroughfare, when the river was at its lowest summer level; as though these remains extended below the lowest point to which the river could fall at the present time.

No change in the level of the river is reported in historical times, so that the remains found in these submerged tracts along the present shores, seem to be of considerable antiquity.

In conclusion I wish to express my thanks to Professor L. W. Bailey for information furnished and to Mr. Geoffrey Stead for the sketch-map accompanying this article.